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A PROGRESS REPORT FOR 1938 ON JAPANESE BEETLE
QUARANTINE AND CONTROL, EUROPEAN CORN BORER
CERTIFICATION, CERTIFICATION OF PRODUCTS UNDER
THE GYPSY MOTH QUARANTINE, AND
DUTCH ELM DISEASE ERADICATION

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JAPANESE BEETLE CONTROL OPERATIONS DURING 1938

The last public hearing on the extension of the Japanese beetle quarantine to newly infested States was held in the United States National Museum in Washington on November 16, 1935. This omission, for the last three years, of the customary annual get-together, does not indicate that there has been a negligible spread of the insect around the boundary of the area in partially regulated States. Rather, it reflects the successes that have been achieved in securing State and local cooperation in soil-treating campaigns to control isolated infestations, and the effectiveness of such treatments in suppressing established or incipient infestations. The extent of State cooperation in this control work also manifests, in some measure, their appraisal of the Japanese beetle as a pest of economic importance, as well as the price they are willing to pay to avoid inclusion in the area under Federal quarantine. States outside the quarantined area strongly indicate that they do not want their territory opened up as an outlet for infested products from the heavily infested coastal States.

Following a suggestion made about a year ago by Dr. Lee A. Strong, Chief of the Bureau of Entomology and Plant Quarantine of the U. S. Department of Agriculture, the Division of Japanese Beetle Control utilized all the principal Bureau field stations throughout the United States in a Japanese beetle trapping survey. Starting in April and extending into July, the trapping section did quite a mail-order business in small lots of traps. In all, 1,920 traps were distributed in lots of a dozen each to Bureau field stations in 36 States, including 29 nonquarantined States, and seven States partially infested. The only nonquarantined States not represented in this bureau-wide field survey were Arkansas, Nevada, Oklahoma, South Dakota, and Kentucky. The regular trapping program took care of trap scouting in Kentucky. This left only four States that were not trapped to some degree in this season's program. In only two instances were beetles caught in traps set and tended by staff members of the field stations. A solitary beetle was caught at Sandusky, Ohio, and one at Savannah, Ga. These beetles were both trapped toward the end of the probable emergence dates in the respective cities, consequently it was too late to rush in additional traps to determine whether any more-extensive infestation existed. Both cities are on the list for more-concentrated trapping next season. The negative results of this countrywide sampling of representative areas were encouraging. They were indicators of the nonexistence of the beetle in a large section of the country that would not have been reached in the regular trapping program.

Last summer the division cooperated in a large-scale campaign for Japanese beetle control inaugurated by the University of Maryland Extension Division. Approximately 40,000 traps were operated in the State during the summer. Part of these were furnished by this Division, but the majority were traps manufactured in the Maryland penitentiary. Total trap catches in Maryland during the season amounted to 123,166 quarts of beetles. These would weigh 42.3 tons. Trapping was carried on in 89 cities, towns, and villages. In heavily infested areas in Cecil, Baltimore, Kent, Somerset,

and Worcester Counties, demonstration trapping was sponsored on farms. The program was designed to retard and control the Japanese beetle in infested areas. Educational work was an essential part of the program. Demonstrations of spraying and soil treatment, colonization of parasites, and adjustment of planting dates were several phases of the summer's control activities. The 42.3 tons of beetles caught in Maryland last summer is considerably under the 55.3 tons of beetles caught in 2,100 traps with 1-gallon beetle receptacles operated by the New Jersey Department of Agriculture in Salem County, N. J., during the summer of 1932.

The regular trapping program was carried on in 18 States. At the seasonal peak, 97,786 scouting-type traps were in operation, and 345 trap inspectors were employed, usually for 30 working days, to place and tend the traps. Of this maximum personnel, 35 men in Detroit were supplied jointly by the city and the Works Progress Administration, 29 men working in Erie, Pa., were furnished by the National Youth Administration, and 29 men in Chicago and 92 in St. Louis were secured through the W.P.A. The remainder consisted of 6 Federal appointees, 117 Federal per-diem workers, and 14 State appointed and 23 State per-diem employees.

Traps were distributed by this Division in 402 cities and towns in the 18 States. Throughout the season beetles were caught at 95 of the trapping points. Only 37 of these catches were first records, the remainder being from sparse infestations carried over from previous years.

The only first-record infestations showing enough beetles to warrant quarantine or control measures were confined to the partially regulated States. Three first-record infestations in Illinois were of one or two beetles each. The same was true in the case of a single first record in Iowa, two in Michigan, and three in North Carolina. In States partially under regulation, first-record collections were made in three localities in Maine, four in Maryland, eight in New York, nine in Ohio, and four in Virginia. Of these the only infestations of an established nature that would warrant soil treatment or quarantine extension were those at Jefferson, Lander, and Queen Anne, Md.; Mount Morris and Brighton, N. Y., the latter a suburb of Rochester; and Dennison, Dover, and Newark, Ohio. Some of the incipient or negligible infestations--ranging from 1 to 10 beetles each--will probably be included in the regulated area because of their proximity to the main regulated zone, or their location between the main regulated area and some of the more important infestations that may be regulated.

Of considerably more consequence than the first-record infestations were the increased beetle populations in quite a number of cities and towns in which the insect had been captured in previous years.

Since trapping operations began in May 1938, the Division's spray trucks have been utilized in soil-poisoning operations in 10 cities. The total area sprayed was just short of 500 acres. The Bureau of Entomology and Plant Quarantine furnished the spray equipment, operators of the trucks, and a co-supervisor to cooperate with the man designated by the State to supervise the labor. The State man also served notices on property owners, telling them of the treating procedure, and cared for any necessary details

required by State law. Lead arsenate, labor for its application, and all local arrangements for water, storage of materials, and posting of warning signs were also State contributions. There has been no change in the standard dosage of 1,000 pounds of lead arsenate per acre for control of isolated infestations.

The most extensive of the soil-treating jobs was that in Chicago. Here 160 acres were treated, covering the sections where most of the beetles were caught in the city last summer. A consistently good soil-treating program in Chicago has effected progressive reductions in the annual finds, starting at 3,740 in 1936 and tapering off to 384 in 1937 and to 330 in 1938.

The capture of 27 beetles in St. Louis last summer showed that the pest has not been completely eliminated in that city, despite the inability of over 12,000 traps to capture more than a lone beetle there in 1937. There is cause for great satisfaction, however, in the fact that only one of the beetles trapped last summer was taken in a section that had received a lead arsenate application in any year since the treating program began in St. Louis in 1934.

The principal quarantine expansion growing out of last year's trap survey has been in Ohio, where a few counties have been added and additional island-type quarantined areas set up to include Mansfield and Newark. The State intends to treat some of the more important infestations, thereby keeping them out of the regulated zone.

Completion of soil treatments in Detroit, Mich., Oil City and Erie, Pa., Louisville, Ky., Atlanta, Ga., and Winchester and Harrisonburg, Va., avoids quarantine action in these cities for the coming year. Assurances have been received from the State Entomologist of Indiana that their treating program will be continued this spring to include the principal infestations discovered there the past season. Minor extensions of the area were made effective on February 20, 1939, to take in a few infestations near the quarantine border in Maryland, Pennsylvania, Virginia, and West Virginia.

Action with respect to several infestations in North Carolina and New York has been deferred to give those States an opportunity to undertake chemical treatment of the infestations this spring.

Sixteen nurseries that had been assigned a class III status owing to the finding of one or a few beetles on the premises in previous years qualified for rescouting last summer. Of this number, three were found uninfested and were again assigned to the preferred class I status. Infestations on four properties were found to be limited to a portion of the nursery, thereby permitting the nurseries to be subdivided and reclassified, giving these four establishments at least a small class I area from which stock may be shipped without treatment.

Nurseries eligible for rescouting diminished over the year before, when this practice was inaugurated. In 1937, 67 establishments were rescouted. In 1938 seven nurseries were resurveyed.

Summing up the Japanese beetle situation, then, it may be said that nothing startling has developed in the course of the last season's scouting.

EUROPEAN CORN BORER CERTIFICATION

In the European corn borer certification work there has been a considerable spurt to comply with the State quarantines of Arizona, California, Colorado, Georgia, Louisiana, Nevada, Oregon, Texas, and Utah. Inspection services are available through the gypsy moth and Japanese beetle inspection corps and the corn borer inspectors in Detroit and Indianapolis. During the last year 23,200 certificates were issued, an increase of 17 percent. This increase in certifications was principally due to larger shipments of gladiolus and chrysanthemums from Virginia, Maryland, and New York.

CERTIFICATION OF PRODUCTS UNDER GYPSY MOTH QUARANTINE

Based on three successive years of negative scouting under supervision of the Division of Gypsy Moth and Brown-Tail Moth Control of the Bureau of Entomology and Plant Quarantine, it has been possible this season further to reduce the gypsy moth regulated areas in New Hampshire and Vermont. This release of territory extended to 22 towns in Vermont and 4 towns in New Hampshire. This revision was of importance to Christmas-tree operators, since balsam fir and spruce are cut and shipped in quantities from these towns. It also released from regulation the important marble and granite shipping districts centering around Rutland, Vt. In all, considerable certification work has been eliminated by the freeing of this territory.

Increased gypsy moth infestation in parts of Maine, on the other hand, necessitated shifting of a sizable block of towns in that State from the status of lightly to generally infested territory. Sections of six Maine counties were involved in the change. In addition, similar changes in status were made in several towns each in three counties in Vermont and a few towns in a single New Hampshire county. None of the towns newly assigned to the generally-infested-area class are important as centers for Christmas-tree cutting, as only 10 carloads of Christmas trees were inspected and certified from them during 1937.

These changes in regulated area were accomplished under a revision of the gypsy moth quarantine and supplementary regulations effective September 29, 1938.

Scouting records of the Division of Gypsy Moth and Brown-Tail Moth Control were also utilized in platting towns in the lightly-infested area that were scouted with negative results in 1938 by Civilian Conservation Corps or Works Progress Administration crews. In these towns certification of Christmas trees was granted with a minimum inspection of individual trees. In New Hampshire and Vermont it has been possible to confine the actual tree-by-tree inspection of Christmas trees in the lightly infested area to a strip of territory mostly one or two tiers of towns wide. The situation in Maine did not warrant any relaxation of tree inspection in the lightly infested sections.

Christmas tree inspection in the generally infested area, of course, is not a problem, since the quarantine acts as an embargo on the movement of these trees from that territory.

Continued heavy infestation in scattered sections of the generally infested zone resulted in large quantities of egg masses being removed in the course of inspection of quarantined products. Shipments of forest products were the most heavily infested. Typical removals in the course of an inspector's daily rounds included 1 larva, 29 pupae, and 32 egg clusters removed from a carload of lumber examined at Westcott, Maine, on August 5 prior to shipment to Toledo, Ohio; and 75 egg clusters creosoted and removed from a carload of birch firewood inspected on October 21, 1938, as it was loaded at Cornish, Maine, for transportation to Philadelphia.

A practicable method of ridding wood edgings of gypsy moth infestation in the process of converting them into chips or shavings was successfully worked out in consultation with an engineering firm. Need for such a procedure was imperative to facilitate the certification of a large quantity of wood shavings being shipped to Brooklyn, N. Y., by a lumber company in the heavily infested area. By installation of a new type of cutter and blower, shavings came through free of all traces of egg masses or individual eggs. Slabs containing a dozen or more egg masses were fed into the machine, to test its performance. All bark debris and eggs were satisfactorily mashed by the cutter and separated from the shavings by the blower.

Work is also being done on a machine that may eventually reduce to a minimum actual piece-by-piece inspection of lumber. This machine is to be equipped with brushes and rolls that will remove egg clusters from the top, bottom and sides of lumber as the boards pass through.

DUTCH ELM DISEASE ERADICATION

The Dutch elm disease is still found threatening the American elm in southeastern New York, southwestern Connecticut, and northern New Jersey. Pennsylvania has also been invaded, 10 elms infected with the disease having been discovered in Bucks and Northampton Counties by scouts working in that State during the summer of 1938.

Many diseased elms were found during 1938 in certain so-called "hot spots," most of which are localized in north-central New Jersey.

The existence of these localized areas of heavy infection has resulted in a considerable increase in the number of trees confirmed as diseased in 1938 as compared with the annual finds since 1930, when the presence of the disease in this country was first determined. Systematic scouting of all elms in the infected zone and in a strip of territory 10 miles wide surrounding the zone resulted in the discovery of over double the number of diseased trees found in any previous year. During 1938 over 18,000 elms were condemned. New Jersey had 16,248 of these disease cases, New York 1,321, and Connecticut 535. There was little change in the number of diseased trees found in New York. The big increases occurred in New Jersey, more than

tripling those of any previous year, and in Connecticut, where there was a fourfold step-up in confirmed cases. The largest number of confirmations in previous years was 7,657 in 1936. The cumulative total of confirmations since 1930 is now 46,258. This number in a solid forest stand of usual density would cover 1,700 acres, or would be sufficient to replace all the elms in the city of Boston, where this species is the predominating street tree.

The principal spread of the disease as revealed by the past summer's scouting is a short jump into Pennsylvania from the near-by infected area in New Jersey and a more serious increase in area in Dutchess County, N. Y. The Dutchess County infection is of particular importance because it brings the line of infection to within 15 miles of the Massachusetts-New York State line. Over 80 diseased elms have been found in this county since discovery of the first infection there in June. Intensive elm sanitation work is being rushed on all trees within a mile of the few focal points of the disease scattered in several towns in Dutchess County. Strenuous efforts are being made to stem the spread of the disease before it gains entry into the northern New England States, with their luxuriant elm stands in country-side and urban communities.

There are undoubtedly a number of factors that have contributed to the northward spread of the disease in New York, but probably the most important contributing cause has been the inability to scout adequately the areas near the outer borders of the 10-mile protective zone surrounding the territory known to contain infected trees.

Results of the eradication activities in sections of the tri-State infected zone surrounding New York City are still considered promising. The disease is believed to be under control in much of this area. It is the unexpected increase of the disease in certain "hot-spot" areas in New Jersey and in Connecticut, the spread of the generally infected territory in New York, and the short jump into Pennsylvania that have introduced further obstacles in combatting the disease. The clean-up of these situations will be one of the major operations of the Bureau forces during the current year.

There were no reappearances of the disease in Baltimore, Brunswick, and Cumberland, Md., Cincinnati and Cleveland, Ohio, or Norfolk and Portsmouth, Va., where trees infected with the disease had been destroyed in previous years. Continued eradication work in Indianapolis, Ind., accounted for destruction of 34 trees there in 1938, bringing to 99 the number of disease cases in that city over a period of 5 years. Three confirmations were reported from Athens, Ohio, at which point a single case was discovered the previous summer.

The Bureau's fleet of autogiros was increased to five serviceable ships during 1938. These were of material assistance in scouting in the border areas of New Jersey, Pennsylvania, New York, and Connecticut, and in scouting railroad rights-of-way over which the elm logs that introduced the fungus to this country travelled to middle-western veneer mills. Autogiro scouts were credited with the discovery of a number of the infected trees in Dutchess County, N. Y.

In 1938 over 900,000 elms were removed by crews engaged in elm sanitation, selective clear cutting in the vicinity of infections, and clear cutting of swampy and mountainous areas. The accumulative total of elms destroyed in the varied operations of eradication, sanitation, and clear cutting since the work was organized in 1931 is nearing the 5,000,000 mark.

In a news article released by the United States Department of Agriculture Press Service on March 26, 1938, attention was called to observations of plant pathologists of the Department that may complicate the control efforts. Close studies of the disease showed that the causal fungus may be present in an elm for several years without giving any outward sign of its presence. These are latent cases of the disease that are almost certain to be missed by the scouts in their search for wilted or dying foliage and branches. They apparently survive for at least a time without the characteristic symptoms. At the same time they serve as potential centers of infection. After the concealed disease has broken out in such trees and they become prey to invading elm bark beetles, spread of the disease may occur. Thus scattered cases of the disease may reappear in sections presumably rid of the fungus. Another reversal of previously held theories is the discovery that the fungus, under unusually favorable conditions, may live and grow in dead elms. These newly found facts emphasize the need for searching out and destroying all dead and decadent elms in the zone of infection.

An example of a tree with just such concealment of symptoms is right at hand. Sanitation crews in the Wiley's Ford, W. Va., sector have been engaged in selective clear cutting. They were taking out all elms in the neighborhood of the diseased elms found there the year before. Only trees of esthetic value were left, and from these was pruned all beetle wood. The crew removed a twin elm with two 10-inch leaders, which to all outward appearances was a healthy tree. But in felling and burning it they detected discoloration in the wood. A sample sent to the laboratory was confirmed as diseased. Some of our best scouts had gone over this area thoroughly three times, and they certainly would have sampled the tree had it shown the slightest outward symptoms of wilting or yellowing. The crew that took down the tree reported that none of the crown showed any evidence of disease. This is one of the many cases established as diseased because sanitation crews sent in samples as they removed elms classed as dead and dying, but not previously sampled as disease suspects. For a while these crews sent to the laboratory samples of all trees they removed that showed apparent symptoms of the disease. This was discontinued when the laboratory became swamped with these samples from dead and dying elms. In a number of instances, however, this type of sampling has accounted for discovery of spread of infection into townships in the 10-mile protective zone.

Another elm that is of interest because it is still standing is a beautiful shade tree located in a restricted residential section of The Oranges, N. J., near Eagle Rock, one of the highest points in the suburban metropolitan area, from which it is said that the homes of 7,000,000 people may be seen. This tree was sampled twice, the second sample showing positive culture. There were no visible symptoms of the disease during the foliar season. There is still no indication of the disease or of any branches

that would be suitable for beetle entry next spring. This tree has been permitted to stand in order that the laboratory may make some close observations of the progress of the disease.

Fortunately, instances of such extreme difficulties in determining the presence of the disease in a tree are rare. Going to the other extreme, the suddenness with which a tree may succumb is illustrated by an elm in Cyster Bay township, Long Island, sampled on September 3, 1938. This tree looked perfectly healthy when another tree near it was confirmed as diseased. When the crew came to take the diseased tree down on September 2 there were no visible symptoms on the second tree. The following day a scout crew stopped at the site to leave some beetle-infested branches for burning. One of the scouts noticed a few yellow leaves half-way up on one side of the otherwise healthy tree. The men took twig samples and noted some brown streaking in the annual ring. Laboratory culturing confirmed the tree as infected. Within a few days of the first observance of wilting, the entire foliage had wilted. In two weeks it had dropped its leaves. The scouts reported that they had never seen any tree die faster than this one.

On September 21, 1938, New England was visited by a most disastrous hurricane. What effect the destruction caused by this storm will have on the spread of the Dutch elm disease can only be determined in the course of subsequent years' surveys. That the uprooted elms, trees with weakened roots that survived the wind's fury, and the presence of hanging branches and elm debris furnish ideal conditions for large increases in the insect vectors of the disease is thoroughly realized. What is termed "beetle wood" is now plentiful throughout the infected area in Connecticut. As rapidly as possible the sanitation crews are cleaning it up. Before the possibility of beetle emergence next May it is hoped to have the infected area rendered completely sanitary, but this is quite a chore, since the number of elms involved--woodland, open field, and street trees--is large.

Several crews are now assigned to the job of mapping elm-free areas in the State of New Jersey. Information is already available showing the localities made elm free by the clear-cutting and silvicultural operations in swampy and mountainous areas. To these are being added the natural elm-free sections. Preliminary figures indicate that scattered areas totalling about 650 square miles in the northern New Jersey work region are free from elms. This means that scouts may not have to penetrate into 1 square mile in each 6 of the area scheduled for scouting in 1939. This write-off should permit increased scouting in districts where elms are growing.

Enforcement of Quarantine No. 71, which serves as an embargo on the movement of elm material from the infected zone, continued during the year. One conviction was secured for a violation involving the transportation of specimen elms from a New York nursery to Alexandria, Va. The shipper was compelled to return the trees to the infected area.

Our relief personnel fluctuated considerably during the year 1938. During January and February the average weekly personnel was around 3,000 men. At the completion of the February 16-day work period, the number on the relief rolls was reduced to 1,350. Not until April were additional (emergency) funds made available so that the force could be increased. Men on the rolls during April and May ranged from 2,200 to 2,350. As soon as our scout schools opened on June 6 we again began to build up our force. It took until the middle of July to obtain sufficient men from which to pick and train some 3,000 scouts. We continued with this number until the middle of August, when the first survey of the work area had been completed. The force was gradually built up from week to week through September until we had a maximum of 3,516 men when the systematic scouting was discontinued at the end of the September work period. Since then we have gone back to our original force of approximately 3,000 relief employees. Our supervisory force at the present time includes 53 appointed and 6 per-diem workers on regular funds, 133 men on appointment but paid from emergency funds, together with 16 appointed and 59 per-diem employees carried on State payrolls.

Regular departmental funds appropriated for Dutch elm disease eradication during the current fiscal year (July 1, 1938 - June 30, 1939) amounted to \$378,489. In addition, allotments of relief funds totalling \$1,892,000 for labor and equipment and an additional sum of \$24,000 for administrative expenses were made to carry the work to the end of February. Funds appropriated by the cooperating States this fiscal year were, New York \$120,000, New Jersey \$38,230, Connecticut \$10,000, Massachusetts \$5,000, and Pennsylvania and Maryland \$500 each, together with a portion of Indiana's \$19,000 lump fund to finance Dutch elm disease, Japanese beetle, and corn borer activities.

Although the spread of the disease, as evidenced by last year's scouting, is disconcerting and presages a lengthening of the fight to stamp out this menace to our native elms, there are no indications that we need to change the ultimate objective of wiping out the disease in this country. It may be necessary to change the emphasis so that the major part of the Federal activities are concentrated toward the periphery of the infected area and beyond, but there is no altering of the goal -- eradication.

May 9, 1939

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Although the spread of the disease has been checked in the United States, it is still present in many parts of the world. It is a disease of the lungs and is caused by a germ which is found in the sputum of infected persons. It is a disease of the lungs and is caused by a germ which is found in the sputum of infected persons. It is a disease of the lungs and is caused by a germ which is found in the sputum of infected persons.